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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/632,891	08/07/2000	Curtis L. Munson	UMMG-1544-C	2969

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EXAMINER

NGUYEN, TAM M

ART UNIT PAPER NUMBER

1764

DATE MAILED: 08/26/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/632,891

Applicant(s)

MUNSON ET AL.

Examiner

Tam M. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 15-25, 27-29, 31, 32, 34-54 and 65-68 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 15-25, 27-29, 31, 32, 34-54 and 65-68 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

The rejection of claim 65 under 35 USC § 112 is withdrawn by the examiner in view of the amendment filed on June 11, 2003.

The rejection of claims 11-14, 30, 33, 55-64 under 35 USC § 102(b) is withdrawn by the examiner in view of the amendment filed on June 11, 2003.

The rejection of claims 1-7, 10, 29, and 65 under 35 USC § 103 over Ogawa et al. (6,042,797) in view of "New Sorbents for Olefin/paraffin separations by adsorption via π -Complexation", Joel Padin and Ralph T. Yang, AICHE Journal, March 1995, pp.1-22. is withdrawn by the examiner in view of the amendment filed on June 11, 2003

Information Disclosure Statement

The reference identified as "New Sorbents for Olefin/paraffin separations by adsorption via π -Complexation", R-. T. Yang E.S. Kikkinide, AICHE Journal, March 1995 vol. 41, No. 3, pp. 509-517" in the IDS of October 6, 2000 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed.

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Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 15-25, 27, 28, 31, 32, 34-54, and 66-68 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-26 of U.S. Patent No. 6,215,037. Although the conflicting claims are not identical, they are not patentably distinct from each other because both the presently claimed process and the patented claimed process are drawn to a similar process which utilizes the same adsorbent. The claimed process of the U.S. Patent does not claim that the alkene feedstock comprises a sulfur compound such as hydrogen sulfide. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the patented claimed process by utilizing the presently claimed feed because it would be expected that the results would be the same or similar when using a feed that comprises a small amount of hydrogen sulfide (e.g., 0.01 mole %) because a small amount of hydrogen sulfide would not affect the outcome of the claimed process of the U.S. Patent.

Claims 1-10, 29 and 65 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-19 of U.S. Patent No. 6,423,881. Although the conflicting claims are not identical, they are not patentably distinct from each other because both the presently claimed process and the patented claimed process are drawn to a similar process which utilizes the same adsorbent. The patented claimed process does not claim

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that the alkene feedstock comprises sulfur compound such as hydrogen sulfide. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the patented claimed process by utilizing the presently claimed feed because it would be expected that the results would be the same or similar when using a feed that comprises a small amount of hydrogen sulfide (e.g., 0.01 mole %) because a small amount of hydrogen sulfide would not affect the outcome of the claimed process of the U.S. Patent.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-7, 10, 29, and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over "New Sorbents for Olefin/paraffin separations by adsorption via π -Complexation", Joel Padin and Ralph T. Yang, pp.1-22 in view of Ogawa et al. (6,042,797).

Padin discloses a process for separating olefins (e.g., propylene) from an olefin/paraffin mixture by using an adsorbent having a monolayer of a silver compound (e.g., AgNO_3 , AgI , or AgCl) dispersed on substantially the surface area of a carrier (e.g., SiO_2). The carrier has a BET surface area of about $384 \text{ m}^2/\text{g}$ and a pore size of about 8.4 Angstroms. The adsorption step is operated at a temperature of about 25°C and at a pressure of about 1 atm and wherein the retaining of alkene is accomplished by formation of π -complexation bonds between the silver compound and the alkene. (See pages 1-14)

Regarding claims 1 and 29, Padin does not disclose that the gaseous alkene comprises a hydrogen sulfide in amounts normally in conventional cracked gas stream or up to 60 mole %. However, the adsorbent of Padin is the same as the claimed adsorbent and Ogawa discloses a process for removing ethylene from a gaseous mixture containing ethylene and a sulfur compound by contacting the gaseous mixture with an adsorbent. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Padin by using an olefinic feed comprising hydrogen sulfide because sulfur compounds would not affect the outcome of the process because the Padin adsorbent is the same as the claimed adsorbent. Therefore, it would be expected that the Padin adsorbent would

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be effective in the separation step in the presence of hydrogen sulfide in the amount of at least 0.01 mole %.

Regarding claims 1 and 29, Padin does not disclose the step of changing at least one of the pressure and temperature to release the alkene-rich component from the adsorbent. However, Ogawa teaches that the adsorption step is operated at a higher temperature than the desorbing temperature (see col. 3, lines 2-5; col. 7, lines 14-18). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Padin by changing temperature as taught by Ogawa because such temperature change is effective to desorb alkene from the adsorbent.

Regarding claim 65, Padin does not disclose that the alkene feedstock is a conventional cracked gas stream before any desulfurizing distillation steps. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Padin by using the claimed feedstock because of the similarity between the claimed feedstock and the modified Padin feedstock, it would be expected that the results would be similar when using the claimed feed.

Claims 8 and 9 and are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above, and further in view of Ramachandran et al. (5,744,687).

Regarding claims 8 and 9, Padin does not disclose the step of changing at least one of the pressure and temperature to release the alkene-rich component from the adsorbent. However, Ramachandran discloses a method of separating gaseous alkene (e.g., ethylene) from a gaseous alkane by an adsorption process. The desorption step is operated at a temperature from about 100 to 350⁰ C and at a pressure from about 20 to 5000 millibars. (see col. 1, lines 48 through col.

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5, lines 52). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Padin by changing pressure as taught by Ramachandran because such pressures and temperatures are effective to desorb alkene from the adsorbent.

Claims 27, 28, and 32 are rejected under 35 U.S.C. 103(b) as being unpatentable over Milton (2,882,243).

Milton discloses a process of adsorbing butadiene from a hydrocarbon feed mixture containing butene by using an A-zeolite adsorbent which comprises alkali and alkaline earth metal cations. The adsorbing occurs at a temperature around 25 to 100 °C and at about 200 mmHg pressure. The adsorbent is activated by heating it at a reduced pressure to remove adsorbed materials. (See col. 4, lines 20-25; col. 6, line 50; col. 12, lines 7-11; col. 15, lines 1-11; col. 20, lines 10-39)

Regarding claim 28 and 32, Milton does not disclose the pressures and temperatures in the desorption step. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Milton process by desorbing butadiene from the adsorbent at a temperature from about 70 to 120 °C at a pressure from 0.1 to 5 atm because Milton's adsorption temperature for butadiene is about 25 °C and Milton also discloses that the conditions used for desorption of an adsorbate from zeolite A vary with the adsorbate and include raising the temperature and/or reducing the pressure. Therefore, it would be effective to operate the desorption step by utilizing a temperature higher than 25° C (e.g., 70° C) and at a lower pressure (e.g., 1 atm) in the process of Milton.

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Regarding claim 32, Milton does not disclose that sulfur compounds (e.g., hydrogen sulfide) and its amount are contained in the feedstock. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the Milton process by utilizing a feedstock containing a tiny amount of hydrogen sulfide (e.g., 0.01 ppm) because it would be expected that the tiny amount of hydrogen sulfide present in the feedstock of Milton would not affect the outcome of the process of Milton.

Response to Arguments

The argument that neither the '037 nor '881 patents teach or suggest a method of separating hydrocarbons as claimed in a gaseous mixture which includes hydrogen sulfide present in amounts normally present in conventional cracked gas stream is not persuasive because the adsorbents of both patents are the same as the claimed adsorbent. Therefore, it would be expected that the adsorbent of both patented processes would be effective in separating hydrocarbons in the presence of the claimed amount of hydrogen sulfide.

The argument that the Padin/Yang reference was not published until 2000 is not persuasive because it is noted that the reference was faxed on August 28, 1998. Therefore, the examiner's position is that the reference is known in 1998.

The argument that the Padin reference does not teach or suggest a method of separating hydrocarbons as claimed in a gaseous mixture which includes hydrogen sulfide present in amounts normally present in conventional cracked gas stream is not persuasive because Padin does not disclose that the adsorbent is incapable of adsorbing olefins in the presence of hydrogen sulfide and the Padin adsorbent is the same as the claimed adsorbent. Therefore, it would be

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expected that the Padin adsorbent would be capable of adsorbing olefins in the presence of the claimed amount of hydrogen sulfide.

The argument that Ogawa does not disclose the adsorption process of olefins in the presence of hydrogen sulfide as claimed is not persuasive because the examiner uses the Ogawa reference to modified the desorption conditions of Padin and to show that other contaminants can be present in the adsorption process.

The argument that Milton does not teach or suggest a method of separating hydrocarbons as claimed in a gaseous mixture which includes hydrogen sulfide present in amounts normally present in a conventional cracked gas stream is not persuasive because it would be expected that, in a short run, the Milton adsorbent would be capable of adsorbing olefins in the presence of hydrogen sulfide as claimed.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tam M. Nguyen whose telephone number is (703) 305-7715.

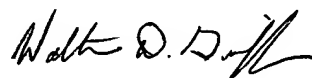
The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 703-308-6824. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Tam M. Nguyen
Examiner
Art Unit 1764

TN


Walter D. Griffin
Primary Examiner